

REMARKS

In the patent application, claims 1-24 are pending. In the office action, all pending claims are rejected. Applicant has amended claims 1, 14, 17, 23 and 24, and added new claims 25-27 as follows:

Claims 1, 14, 17, 23 and 24 have been amended to specify the types being scene transition types. Claim 1 has further been amended to include the limitation that information indicative of the type of scene transition is retrieved from the encoded video bitstream for identifying the type of scene transition. The support can be found on Figure 3 and p.11, lines 11-14 of the specification.

New claim 25 has the limitation of identifying frames associated with the scene transition and providing information for use in a decoding process about the scene transition type in the encoded video data stream. New claim 26 has the limitation that the information is provided in a supplemental enhancement information message. New claim 27 has the limitation that the information is provided for each frame belonging to the scene transition. The support can be found on Figure 2, p.10, lines 19-28.

No new matter has been introduced.

A. 103 Rejection of claims 1-24

At section 4 of the office action, claims 1-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Wells et al.* (U.S. Patent Number 6,310,915, hereafter referred to as *Wells*), in view of *Viscito et al.* (U.S. Patent Application Publication Number 2004/0005007, hereafter referred to as *Viscito*).

In rejecting these claims, the Examiner states that *Wells* discloses a method of error concealment wherein an error concealment procedure is applied to conceal an error in a frame belonging to a transition based on the identified type of scene transition (col.10, lines 10-20; col.12, lines 45-67). The Examiner admits that *Wells* fails to disclose that the error concealment is carried out in the decoding process, but points to *Viscito* for disclosing a scene change detector in a decoding process.

Applicant respectfully disagrees.

A.1. The Cited Wells Reference

Wells discloses a method of decoding a previously encoded video signal and re-encoding the decoded video signal to a second encoded representation (see Abstract). In particular, *Wells* discloses having scanners 22, 22' to gather information regarding each of k pictures and the k-1 pictures that follow it in the previously encoded video signal (col.9, line 52-54). The information includes (a) the picture coding type (I, B or P),... (p) characteristics of the content of the video, such as scene changes, dissolves, fades, slow motion sequences, etc. (col.10, lines 12-14). The information may indicate the encoded representation of the previously encoded video signal (col.10, lines 51 to col.11, line 2). The purpose of gathering the information is to allow the encoders 20, 20' to adjust encoding in order to re-encode the video signal more optimally (col.11, lines 5-7). The encoding adjustment includes a number of actions, including (2) changing channel bit rate, (3) changing picture resolution, ... (9) enabling/disabling error concealment motion vectors. The optional error concealment motion vectors enable reconstruction of corrupted rows of macroblocks. Thus, it is possible for the encoders 20, 20' to omit error-concealment motion vectors. Alternatively, the encoders 20, 20' can retain previously encoded or add newly generated error-concealment motion vectors (col.12, lines 48 – 65).

At col.12, lines 45-67, *Wells* discloses:

(9) Enable (retain or add)/disable (delete or refrain from generating) error-concealment motion vectors, slice headers or both: Error-concealment motion vectors enable reconstruction of corrupted row of macroblocks. However, error-concealment motion vectors are strictly optional and occasionally are not needed in low channel error environments (e.g. if the channel is a storage medium such as an optical disc). Likewise, slice headers are also optional. ... Thus, it is occasionally desirable for the encoder 20, 20' to omit (i.e. delete previously encoded or refrain from generating new) error-concealment motion vectors, slice headers or both, in the re-encoded video signal in an effort to conserve bits. In the alternative, the encoder 20 and 20' can include (i.e., retain

previously encoded or add newly generated) error-concealment motion vectors, slice headers or both in the re-encoded video signal.

Thus, *Wells* only discloses that the encoder is able to retain, delete or add error-concealment motion vectors when re-encoding the video signal. *Wells* only discloses that if there are error concealment motion vectors or slice headers in the frame, they can be **included** in the re-encoded video signal so as to enable the reconstruction of corrupted row of macroblocks. Furthermore, *Wells* discloses obtaining characteristics of the content of the video, such as scene changes, dissolves, fades, etc. The purpose of gathering the information is to allow the encoders 20, 20' to adjust encoding in order to re-encode the video signal more optimally. However, *Wells* does not disclose or even suggest that the error concealment in a frame belonging to the scene transition is part of the re-encoding process. Furthermore, *Wells* does not disclose or suggest that the error concealment motion vectors and/or slice headers included in the re-encoded video signal are based on the type of scene transition.

Furthermore, the information such as scene changes, fade, dissolve, etc. can only be determined by at least partly decoding the bitstream and comparing the pixel data of each scene (col.10, lines 16-20). This shows that the information indicative of the scene transition type cannot be retrieved from the encoded video stream. *Wells* requires a video decoder for decoding the encoded pictures so that pixel data in the pictures can be compared in order to detect the scene changes.

The Examiner admits that *Wells* fails to disclose the application of the method in a stand-alone decoding process, but points to *Viscito* for disclosing that feature. In particular, the Examiner states that *Viscito* discloses a hypothetical reference decoder (HRD) for compressed image and video wherein scene change detection is monitored so as to avoid overflow or underflow conditions (paragraph [0080], lines 1-9) in order to maintain low delay in picture presentation (paragraph [0081], lines 1-9).

A.2 The Cited *Viscito* Reference

Viscito is concerned with maintaining a low delay time in picture presentation even when there is occasional presence of large pictures during a scene change. *Viscito* discloses removing or skipping large pictures so as to avoid the underflow condition in the decoder buffer. In order to detect the occasional presence to a large picture, *Viscito* computes the initial arrival time and the final arrival time of a compressed picture to ensure that the initial arrival time of the current picture is not too close to the final arrival time of the preceding picture.

Viscito only discloses comparing the arrival times of two adjacent pictures in a decoder so that large pictures can be skipped or removed. Although *Viscito* identifies the source of “underflow” condition as a scene change, *Viscito* does not disclose obtaining information indicative of the type of scene transition in an encoded video bitstream. *Viscito* does not disclose using the information for error concealment.

A.3 The Combination of the cited *Wells* and *Viscito* References

The Examiner states that it would be obvious for one skilled in the art to incorporate the scene change detection method as disclosed in *Wells* into the decoding process as disclosed in *Viscito* in order to allow the *Viscito* decoding process to accurately detect scene change for overflow/underflow avoidance and thus to keep a low delay time in picture presentation (p.3, lines 11-15, of the office action).

A.4 *Wells*, in View of *Viscito*, Fails to Render Claims 1, 17 and 23 Obvious

It is respectfully submitted that improving the accuracy of scene change detection in the decoding process in order to keep a low delay time in picture presentation has nothing to do with the claimed invention. The claimed invention as claimed in claims 1, 17 and 23 is concerned with applying error concealment in a frame belonging to a scene transition based on the identified type of scene transition.

Wells does not disclose or even suggest that the error concealment in a frame belonging to the scene transition is part of the re-encoding process. *Wells* does not disclose or suggest that the error concealment motion vectors and/or slider headers included in the re-encoded video

signal are based on the type of scene transition. *Wells* discloses decoding the pictures and comparing the pixel data in the pictures in order to detect scene changes. *Viscito* does not disclose or suggest carrying out error concealment in a frame belonging to the scene transition in a decoding process. *Viscito* does not disclose retrieving information identifying the type of scene transition in an encoded video data stream.

For the above reasons, *Wells*, in view of *Viscito*, fails to render claims 1, 17 and 23 obvious.

B. 103 Rejection of Claims 14 and 24

Claim 14 has the limitations of an identifier module for identifying frames associated with scene transition, and a multiplexing module for providing information for use in a decoding process about the type of scene transition in the encoded video data stream comprising encoded video data. Claim 24 has the limitations of means for identifying frames associated with scene transition, and means for providing information for use in a decoding process about the type of scene transition in the encoded video data stream comprising encoded video data.

In rejecting claims 14 and 24, the Examiner states *Wells* discloses means for identifying frames associated with the scene transition (col. 10, lines 65-67), and means for providing information about the type of scene transition in an encoded video data stream (col.10, lines 45-67). The Examiner admits that *Wells* fails to disclose providing information for use in a decoding process, but points to *Viscito* for disclosing using scene change to watch for overflow/underflow.

B.1 The Cited *Wells* Reference

As mentioned in sub-section A.1 above, *Wells* discloses using a video decoder in each of the scanners 22, 22' to decode pictures so that pixel data in the pictures can be compared for scene change detection. The scene change information as obtained by the scanner 22, 22' and, possibly the statistical multiplexer computer 24, is not encoded before the information is provided to the encoder 20. The scene change information allows the encoders 20, 20' to adjust encoding in order to re-encode the video signal more optimally. In *Wells*, the multiplexer 30 is

only used to combine the re-encoded video signals outputted from the transcoders 16, 16' (col.8, lines 12-14). *Wells* does not disclose or suggest that the information about the scene change is provided in an encoded video data stream.

B.2 The Cited *Viscito* Reference

As mentioned in sub-section A.2 above, *Viscito* is concerned with maintaining a low delay time in picture presentation even when there is occasional presence of large pictures during a scene change. *Viscito* discloses removing or skipping large pictures so as to avoid the underflow condition in the decoder buffer. In order to detect the occasional presence to a large picture, *Viscito* computes the initial arrival time and the final arrival time of a compressed picture to ensure that the initial arrival time of the current picture is not too close to the final arrival time of the preceding picture.

Viscito only discloses comparing the arrival times of two adjacent pictures in a decoder so that large pictures can be skipped or removed. Although *Viscito* identifies the source of “underflow” condition as a scene change, *Viscito* does not disclose obtaining information indicative of the type of scene transition in an encoded video data stream. *Viscito* does not disclose or suggest providing information indicative of the type of scene transition in an encoded video data stream.

B.3 The Combination of the cited *Wells* and *Viscito* References

The Examiner states that it would be obvious for one skilled in the art to incorporate the scene change detection method as disclosed in *Wells* into the decoding process as disclosed in *Viscito* in order to allow the *Viscito* decoding process to accurately detect scene change for overflow/underflow avoidance and thus to keep a low delay time in picture presentation (p.3, lines 11-15, of the office action).

B.4 *Wells*, in View of *Viscito*, Fails to Render Claims 14 and 24 Obvious

It is respectfully submitted that improving the accuracy of scene change detection in the decoding process in order to keep a low delay time in picture presentation has nothing to do with

the claimed invention. The claimed invention as claimed in claim 14 is concerned with using a multiplexer to provide information about the type of scene transition in an encoded video data stream comprising encoded video data.

Wells is only concerned with how pictures are re-encoded. *Wells* does not disclose providing the information about the type of scene transition in an encoded video data stream.

Viscito only discloses avoiding large pictures in order to prevent underflow condition. *Viscito* does not disclose providing the information about the type of scene transition in an encoded video data stream.

A person skilled in the art cannot come up with the claimed invention, wherein information about the type of scene transition in an encoded video data stream, even when the cited *Wells* and *Viscito* references are used individually or in combination.

For the above reason, *Wells*, in view of *Viscito*, fails to render claims 14 and 24 obvious.

C. Dependent Claims

Claims 2-13, 15, 16 and 18-22 are dependent from claims 1, 14 and 17 and recite features not recited in claims 1, 14 and 17. For reasons regarding claims 1, 14 and 17 above, claims 2-13, 15, 16 and 18-22 are also distinguishable over the cited *Wells* and *Viscito* references.

D. New claims 25-27

New claim 25 has the limitation of identifying frames associated with the scene transition and providing information for use in a decoding process about the scene transition type in the encoded video data stream.

For reasons regarding claims 14 and 24 stated in sub-section B.4 above, the cited *Wells* and *Viscito* references also fail to render claim 25 obvious.

As for claims 26 and 27, they are dependent from claim 25. Thus, claims 26 and 27 are also distinguishable over the cited *Wells* and *Viscito* references.

CONCLUSION

Claims 1-27 are allowable. Early allowance of claims 1-27 is earnestly solicited.

Respectfully submitted,



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